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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEVE ROCHON, RICHARD S. NORMAN,
and ROBIN BOIVIN

Appeal 2009-006259
Application 09/963,487[1]
Technology Center 2400

Before KENNETH W. HAIRSTON, MARC S. HOFF,
and CARLA M. KRIVAK, *Administrative Patent Judges*.

HOFF, *Administrative Patent Judge*.

DECISION ON APPEAL[2]

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[1] The real party in interest is Hyperchip Inc.

[2] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the "MAIL DATE" (paper delivery mode) or the "NOTIFICATION DATE" (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from a Final Rejection of claims 1-4, 25-37, 40-51, 53-55, and 57-58. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

Appellants' invention relates to a method for regulating packet flow at the ingress stage of a packet switching device in an effort to avoid congestion. Bandwidth utilization information is obtained for each of a plurality of queues at an egress stage of the device to generate a discard probability for each queue. The discard probability is transmitted to the ingress stage, either periodically or at other controlled time periods. Depending on the queue for which the packet is destined and the discard probability for that queue, the ingress stage decides to transmit the packet to the switch fabric. This method "leads to improved bandwidth utilization, since packets which are discarded at the ingress stage will not unnecessarily take up other resources in the device" (Spec. 3:15-4:2).

Claim 1 is exemplary:

1. A method of regulating packet flow through a device having a processing fabric with at least one input port and at least one output port, a control entity connected to the at least one input port for regulating packet flow thereto, and a plurality of egress queues connected to the at least one output port for temporarily storing packets received therefrom, said method comprising:

obtaining bandwidth utilization information regarding packets received at the egress queues, wherein obtaining said bandwidth utilization information includes determining the amount of bandwidth consumed by packets received at each of said egress queues;

determining, from the bandwidth utilization information and the amount of bandwidth consumed by packets received at each of said egress queues, a discard probability associated with each egress queue; and

providing the discard probability associated with each egress queue to the control entity, for use by the control entity in selectively transmitting packets to the at least one input port of the processing fabric.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Blumer	US 2002/0105908 A1	Aug. 8, 2002
Jefferies	US 6,728,253 B1	Apr. 27, 2004
Haskin	US 6,813,242 B1	Nov. 2, 2004
Brewer	US 7,002,980 B1	Feb. 21, 2006
Lyon	CA 2,292,828	Jun. 22, 2001

Claims 1-3, 25-27, 30, 36-37, 40-51, and 57 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lyon in view of Brewer.

Claims 4, 28, 29, 31-35, 53, 54, and 55 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lyon in view of Brewer and Blumer.[3]

Claim 50 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Lyon in view of Brewer and Haskin.

Claim 58 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Lyon in view of Brewer and Jefferies.

Rather than repeat the arguments of Appellants or the Examiner, we make reference to the Appeal Brief (filed August 29, 2007), the Reply Brief (filed February 28, 2008), and the Examiner's Answer (mailed February 6, 2008) for their respective details.

[3] The Examiner has rejected claim 53 but has not set forth the reason for rejection of this claim in the Final Office Action nor the Answer; however the reason is set forth in the Non-Final Action (p. 13; mailed July 01, 2005).

ISSUE

Appellants contend that neither Lyon nor Brewer discloses "determining the amount of bandwidth consumed by packets received at each of said egress queues" and "determining, from the bandwidth utilization information and the amount of bandwidth consumed by packets received at each of said egress queues, a discard probability associated with each egress queue" (App. Br. 8-9).

Appellants' contentions present us with the following issue:

Do the combined teachings of Lyon and Brewer disclose a control entity that regulates packet flow through a device by obtaining bandwidth utilization information regarding packets received at the egress queues to determine the amount of bandwidth consumed by packets received at each of the egress queues and generating a discard probability associated with each egress queue from the bandwidth utilization information and the amount of bandwidth consumed by the packets?

FINDINGS OF FACT

The following Findings of Fact (FF) are shown by a preponderance of the evidence.

Brewer

1. Brewer discloses a multi-Quality of Service (QOS) level queuing structure where packet payload pointers are stored in multiple queues and packet payloads are stored in a common memory pool. Instantaneous drop probabilities are derived from algorithms that measure instantaneous queue size and compare it with calculated minimum and maximum queue sizes. A traditional Weighted Random Early Discard

(WRED) mechanism generates time averaged drop probabilities of the packets. Algorithms are adapted to the multi-level QOS queuing structure, floating point format, and hardware implementation. An arbitration algorithm controls the packet flow traffic from a router egress queuing structure to a single egress port tributary (Abstract).

2. Brewer discloses in Equation 3.1 of the WRED algorithm, used in the router for management of congestion that an average byte count avgByteCnt is obtained for a particular queue into which a packet is being placed, is indexed by both the destination tributary and the QOS level of the incoming packet. The time weighted average for the actual byte count for a particular queue is used to determine the avgByteCnt. A probability (prob1) is calculated by multiplying this avgByteCnt by a constant and then subtracting a different constant as shown in Equation 3.2. The drop probability (dropProb) or discard probability is calculated by multiplying the probability (prob1) by the size of the packet: the smaller the packet the less likely it is to be dropped (col. 8, ll. 30-60).

PRINCIPLES OF LAW

On the issue of obviousness pursuant to 35 U.S.C § 103, the Supreme Court has stated that "the obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 419 (2007). Further, the Court stated "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id.* at 416.

ANALYSIS

Claims 1-3, 25-27, 30, 36-37, 40-51, and 57

Independent claims 1 and 37 recite "determining the amount of bandwidth consumed by packets received at each of said egress queues … determining, from the bandwidth utilization information and the amount of bandwidth consumed by packets received at each of said egress queues, a discard probability associated with each egress queue." Independent claims 40 and 46 recite claim limitations similar in scope.

We consider Appellant's arguments to be persuasive to show Examiner error (*see* App. Br. 11-13; Reply Br. 11-12). We do not agree with the Examiner's finding that Brewer discloses the claimed limitation by specifically disclosing that the traffic flow method of Brewer determines the QOS level (which the Examiner finds to be equivalent to the bandwidth utilization level) and an average byte count (which the Examiner finds to be equivalent to a bandwidth consumed by packets at the egress queue) (Ans. 19). In particular, we do not agree with the Examiner's finding that the QOS level is equivalent to the bandwidth utilization level (Ans. 19).

Brewer discloses a multi-Quality of Service (QOS) level queuing structure where instantaneous drop probabilities are derived from algorithms and the instantaneous queue size is compared with calculated minimum and maximum queue sizes (FF 1). Specifically, Brewer discloses that the average byte count is obtained for the associated queue into which a packet is being placed (FF 2). The time weighted average for the actual byte count is used to determine the average byte count (FF 2). A probability (prob1) is calculated by multiplying this average byte count by a constant and then subtracting a fixed constant (FF 2). The drop probability (dropProb) or

discard probability is calculated by multiplying this probability (prob1) by the size of the packet (FF 2). Therefore, the drop probability (dropProb) is proportional to the probability (prob1) which is proportional to the average byte count (FF 2). The average byte count, however, is proportional to the time weighted average for the actual byte count for the particular queue (FF 2). Since the actual byte count is the number of bytes *waiting* to be transmitted, rather than the number of bytes actually *sent*, the byte count is not indicative of *consumption* (bytes per unit time), but rather of *allocation* (number of bytes). Thus, the probability (prob1) and the drop probability (dropProb) are not indicative of the consumption of bandwidth. Rather, Brewer merely discloses a time-weighted average byte count of a queue (Reply Br. 11) Therefore, we do not agree with the Examiner's finding that the QOS is equivalent to the bandwidth utilization level (Ans. 5 and 19). Rather, we find that the QOS corresponds to authorization and allocation for a specified amount of bandwidth, but it does not equate to the amount of bandwidth *actually consumed*.

We find that the combination of Lyon and Brewer does not disclose "determining the amount of bandwidth consumed by packets received at each of said egress queues." As a result, we will not sustain the Examiner's rejection of independent claims 1, 37, 40, and 46 under 35 U.S.C. § 103, nor that of claims 2, 3, 25-27, 30, 36-37, 40-51, and 57 not separately argued with particularity.

Claims 4, 28, 29, 31-35, 50, 53, 54, 55, and 58

As noted *supra*, we reversed the rejection of claims 1 and 46 from which claims 4, 28, 29, 31-35, 53, 54, and 55 depend. We have reviewed Blumer, Haskin, and Jeffries (the additional references applied by the

Examiner to reject these claims), and find that none of the references teaches the limitation deemed to be absent from the combination of Lyon and Brewer.

We therefore reverse the Examiner's rejections of claims 4, 28, 29, 31-35, 53, 54, and 55 under 35 U.S.C. § 103, for the same reasons expressed with respect to the § 103 rejection of parent claims 1 and 46, *supra*.

CONCLUSION

The references do not disclose a control entity that regulates packet flow through a device by obtaining bandwidth utilization information regarding packets received at the egress queues to determine the amount of bandwidth consumed by packets received at each of the egress queues and generating a discard probability associated with each egress queue from the bandwidth utilization information and the amount of bandwidth consumed by the packets.

ORDER

The Examiner's rejection of claims 1-4, 25-37, 40-51, 53-55 and 57-58 is reversed.

REVERSED

ELD

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